



Faking Volumetric Clouds in Blender using Subsurface Scattering and Nodes

About this document

For a long time I wanted volumetric clouds in Blender. My first try was the particle system, but the results was not very convincing. So after lots of experiments, I found a form to obtain acceptable results. That technique is described in the rest of this document.

I assume you have medium/advanced knowledge of Blender, as I don't go into the tools used to achieve the technique.

What you will need:

- Blender installed on your machine, of course ;)
- Knowledge of particles.
- Knowledge of materials.
- Knowledge of nodes.

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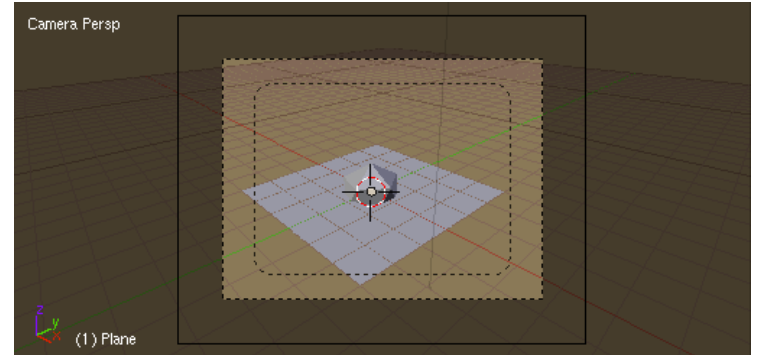


For the impatient

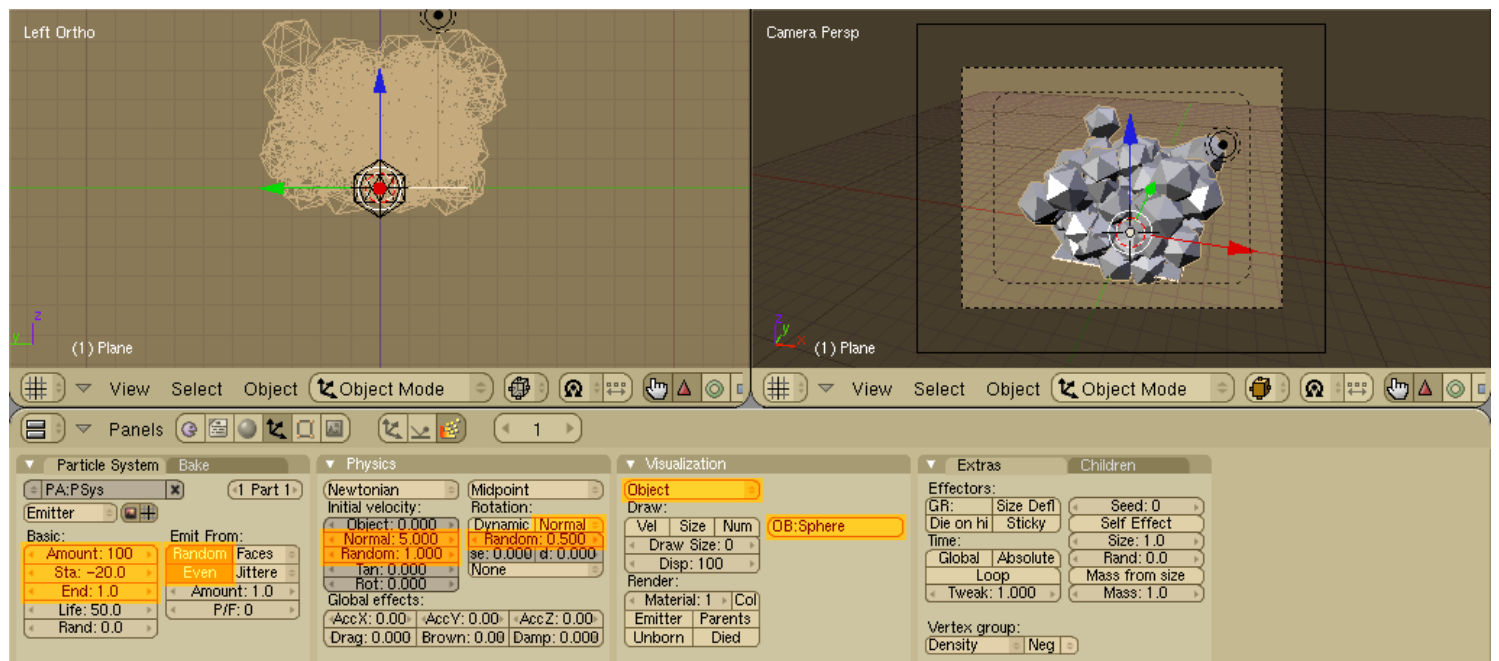
The technique can be resumed in 3 steps: a particle system, a material and a nodes setting.

The particles

Let's create a plane and an icosphere with *subdivision* level to 1.



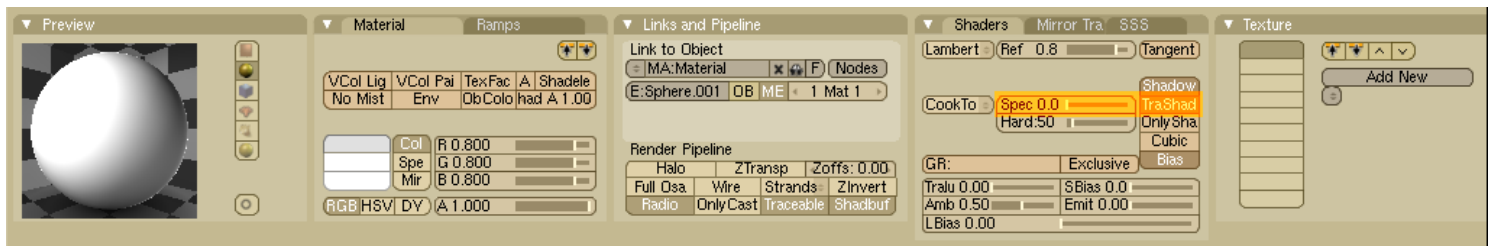
Now, make a particle system in the plane using the icosphere as a particle. The relevant parameters are highlighted. Press ALT+A to create the particles and you must get something like this:



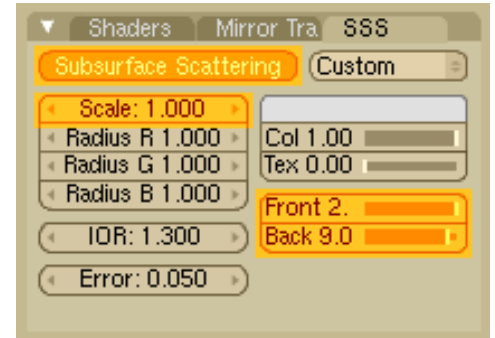
Don't forget to set an appropriate light in the scene and set *Smooth* on the icosphere.

The material

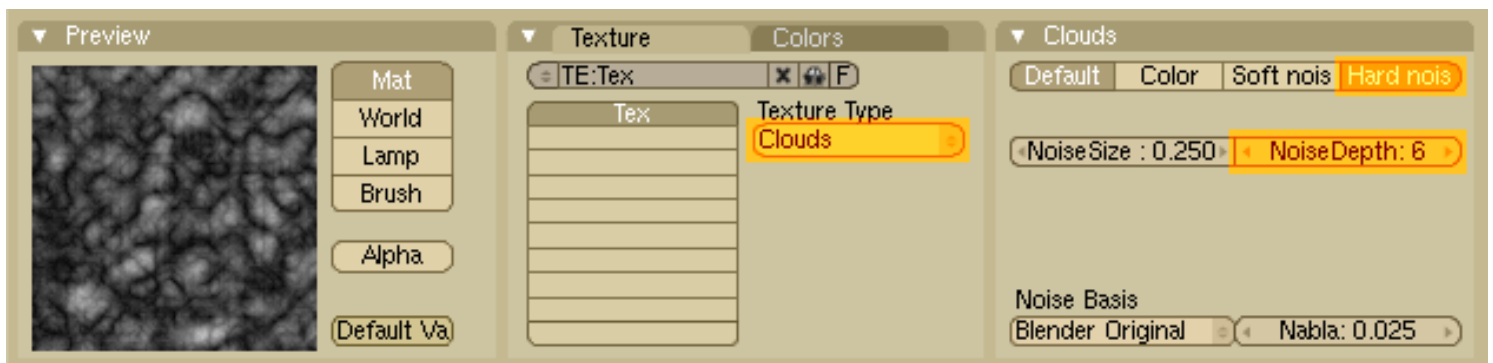
Select the icosphere and add a new material on it. Set the parameters as shown below:



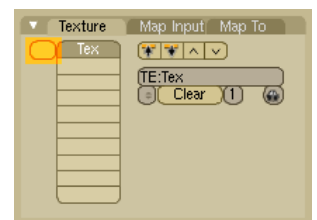
The Subsurface Scattering settings:



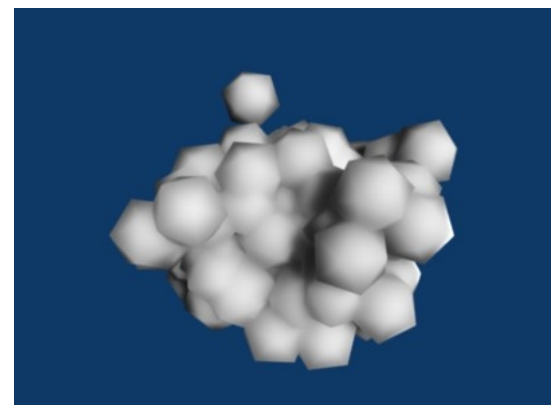
On this material, add a new texture of type *clouds* as shown here:



Blender automatically will assign the clouds to a texture channel. We don't want it, so uncheck the texture.



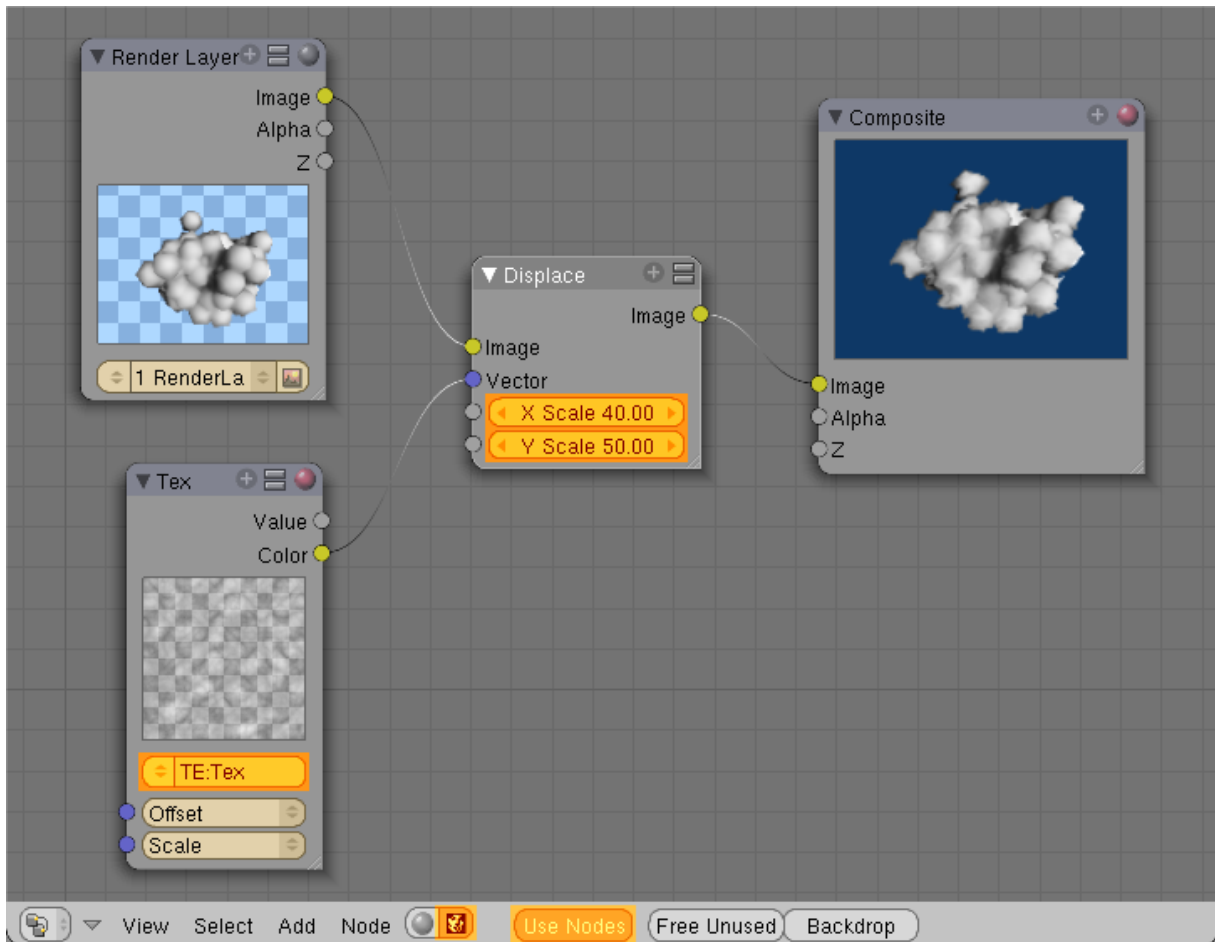
If you make a render, the particles will have to look like this:



The nodes

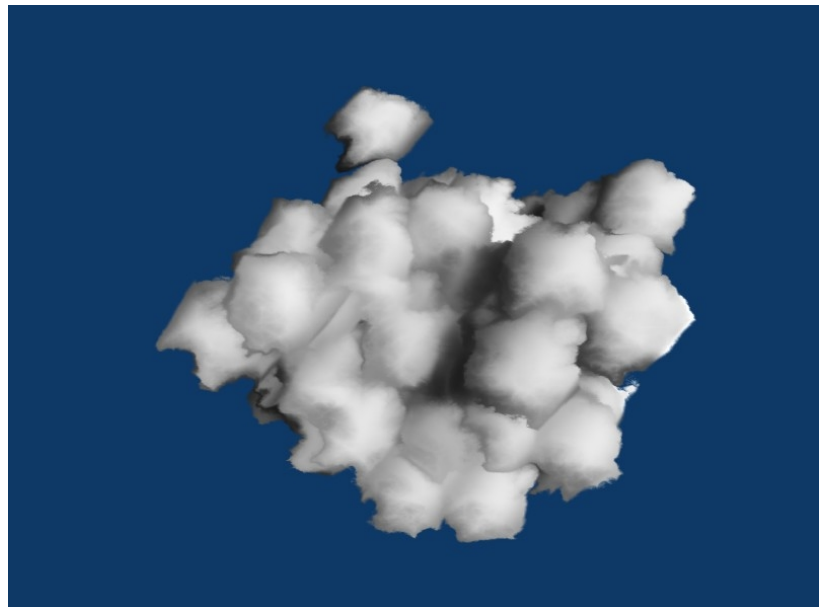
Let's go to a *Node Editor* window and press the *Composite Nodes* and *Use Nodes* buttons.

Basically, we need only two nodes to do the technique: *Displace* and *Texture*. The settings must be like this:



Note that the *Texture* node is using the *Clouds* texture of the particles material. On the *Displace* node, the *X Scale* and *Y Scale* represents the amount of clouds disturb.

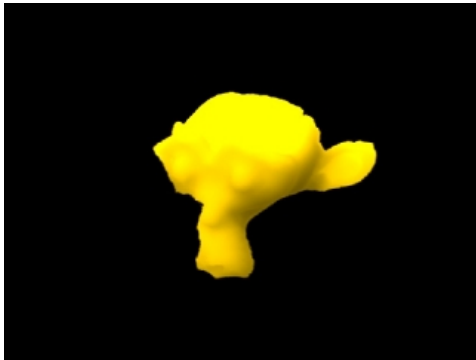
That's all! Let's go to the scene panel, press the *Do Composite* and *RENDER* buttons. This is a 800x600 render.



The details

As we can see, the technique is relatively simple in principle. Of course, it has a number of improvements and details.

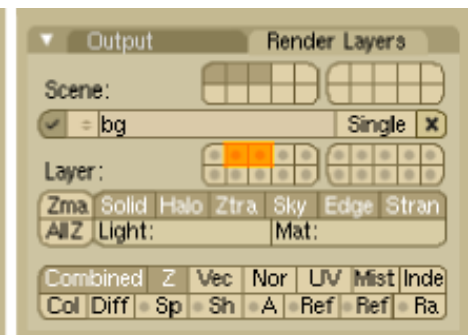
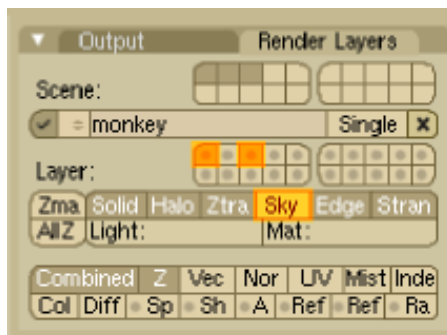
The first is when you need to combine the faked volumetrics with another objects on your scene. This can be done with the *render layers*:



Here, we use 2 *render layers*, one for the monkey and another for the background. If we don't do this, the technique will be applied on **all** the objects and the final render will look like this:



This is the *scene layers* settings that defines the *render layers*. In this case, the monkey is on the first, the background on the second and the lamp and camera on the third.

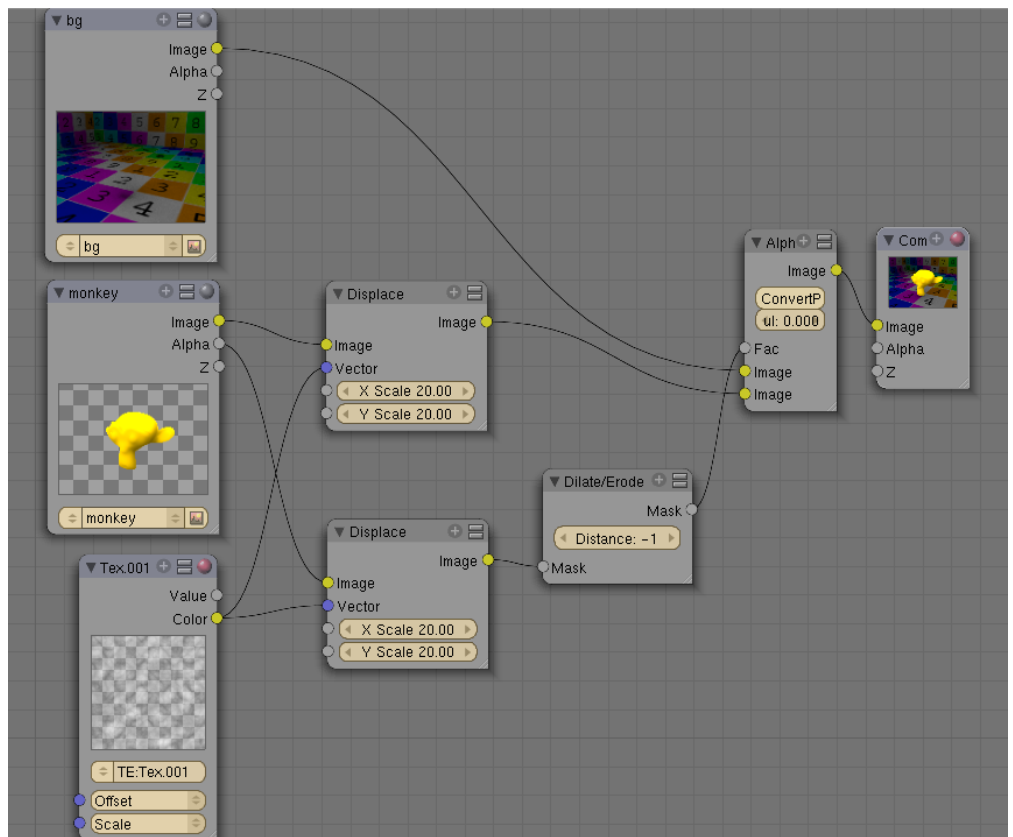


Note that the *scene layer 3* (camera and lamp) exists on the monkey and on the background *render layers*. If we don't do this, the layer can't be seen because there's no light to illuminate and no camera to see the scene.

Here is the nodes setting for the scene:

We have new nodes: a second *Displace*, *Dilate/Erode*, and *AlphaOver*.

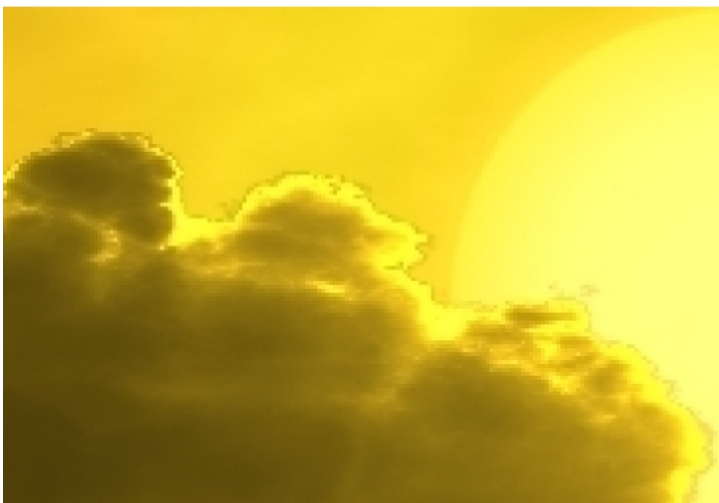
The reason of a second *Displace* node is a bit dumb. Until version 2.45, when you apply *Displace* on a *Render Layer*, it keeps its transparency values and it's ready to use for the composite, but after version 2.46, the transparency is destroyed! And a black background appears instead. I don't know if this is a new 'feature' or a bug...



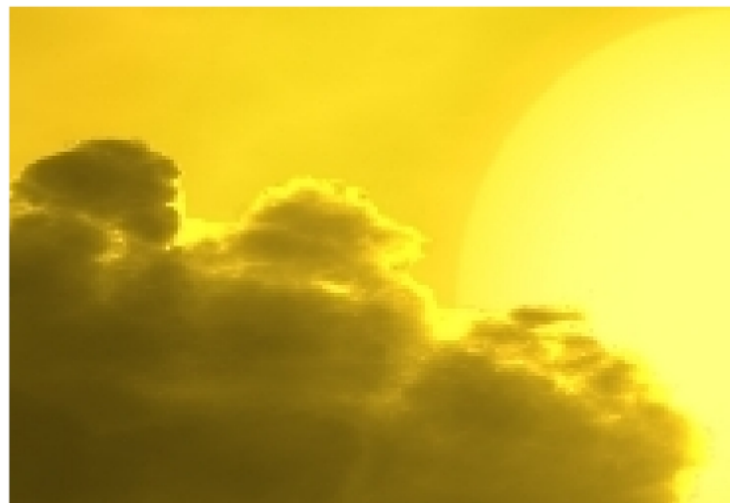
The solution is to get the *Alpha* from the render layer and repeat the *displace*. This has the serious problem that it **doubles** the rendering time! So, if someone knows how to fix it, let me know.

The presence of the *Dilate/Erode* node is a consequence of the previous problem. Because the re-transparency process is not perfect, we get an ugly border around the clouds. Using *Dilate/Erode* with a -1 value, we can clear de edge and obtain a fine integration with the scene.

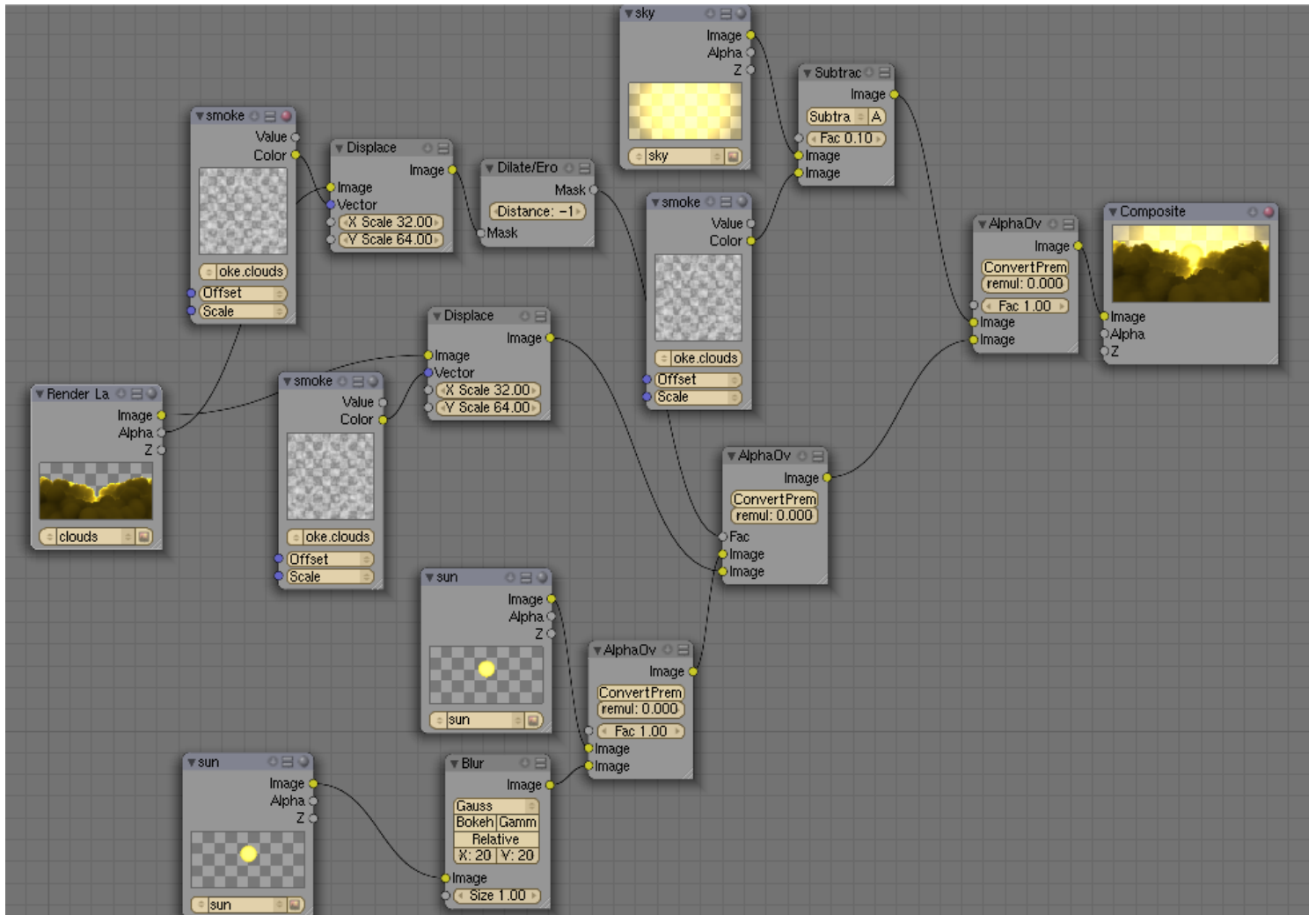
Borders



Without borders



Due to this, the complexity and render times can grow remarkably. This is the nodes settings from the Clouds at Sunset scene:



Conclusion

PROS:

- The technique can produce **very** realistic clouds.
- Can be implemented in a reasonably simple way if you are an experienced Blender user.

CONS:

- It's **slow** (At least with the problem of the transparency).
- The clouds shadows can't be affected by the technique.
- Can be difficult for beginners.

Thank you for reading this document, I hope that it can be of utility. As ever, experimentation is encouraged. You can play with a lot of things like different settings on the clouds texture, the SSS settings, etc.

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